DIGITAL INDIA INITIATIVE AND ROLE OF SOFTWARE AGENT TO IMPROVE USE OF BIG DATA AVAILABLE ON INTERNET

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ABSTRACT

The vision of Digital India is to empower every citizen with access of digital services, knowledge and information. There is data explosion on the World Wide Web. Getting required information about particular subject or topic will be difficult. Web search and Web mining needs to target on the requirements of the user. The use of Software Agent to find information for you on the subject of your choice will automate and ease the process of searching and make digital data or information available to the grass root level. The main objective of this paper is to propose the ease of using web application by incorporating intelligence into them through Software Agents.

INTRODUCTION

Digital India is the mission and vision of Prime Minister Narendra Modi to enable every citizen of India to access digital information for gaining opportunity, knowledge and information.

Digital technologies means inclusion of Cloud and Mobile Based Application provided to citizen and thereby enabling the citizens to access government services, and allow citizens to connect with each other and share information, issues, and enable them to give suggestions.

Big data is large volume of data which may be structured or unstructured. The best example of big data is unstructured data available on Internet. The software agent which is a computer program acts for the user on an agreement to act on one’s behalf and collect required information extracting from this Big data.

Agent may perform the tasks individually. In Complex and distributed system, Agents can be used to monitor the interaction among components particularly when human interaction is unavailable [1][2]

![Figure 1.1 Agent Features](image)

Agents have following properties broadly shown in Figure 1.1 to work on distributed or complex system intelligently[2][3]:

- **Persistence**: The component code will be active and will decide on its own when to execute the code based on the demand.
- **Autonomy**: Agents have decision making capability. They can do selection, prioritization on behalf of user.
- **Social ability**: Multiple agents may work in collaboration with each other. They can communicate with each other to perform the given task.
- **Reactivity**: Agents can respond and react to the external environmental changes
Comparison of Agent:
The term “agent” describes a software abstraction, an idea, or a concept, similar to OOP terms such as methods, functions, and objects.

The concept of an agent provides a convenient and powerful way to describe a complex software entity that is capable of acting with a certain degree of autonomy in order to accomplish tasks on behalf of its host.

But unlike objects, which are defined in terms of methods and attributes, an agent is defined in terms of its behavior.

- Agents are more autonomous than objects.
- Agents have flexible behavior: reactive, proactive, social.
- Agents have at least one thread of control but may have more.

All agents are programs, but not all programs are agents. The programmes and agents are different on the following criteria
- Reaction to the environment,
- Autonomy,
- Goal-orientation and
- Persistence.

There is difference between Agent and Expert system also:
- Expert systems are not coupled to their environment.
- Expert systems are not designed for reactive, proactive behavior.
- Expert systems do not consider social ability.

Impact of Software Agents:
Software agent may offer different benefits to their users by automating complex and repetitive task. The ease of performing complex task will be increased if agents are used in web application.

Intelligent software agents are able to quickly search the Internet and identify the best offers available online, present this information to the end user in aggregated manner. So user need not manually browse various website and do comparison of accumulate the data on his own. There are different type of Intelligent software agent shown in Figure 1.2 [4][5][6] which ease the user task on the web.

Types of Intelligent Agents

- Buyer Agents (Shopping bots)
  Buyer agents travel around a network (e.g. the internet) retrieving information about goods and services. These agents, also known as ‘shopping bots’, work very efficiently for commodity products such as CDs, books, electronic components, and other one-size-fits-all products. Buyer agents are typically optimized to allow for digital payment services used in e-commerce and traditional businesses.

- User agents (Personal Agents)
  User agents, or personal agents, are intelligent agents that take action on your behalf. In this category belong those intelligent agents that already perform, or will shortly perform, the following tasks [5][6][7]:

![Image of Types of Intelligent Software Agent]
Check your e-mail, sort it according to the user’s order of preference, and alert you when important emails arrive.

Play computer games as your opponent or patrol game areas for you.

Assemble customized news reports for you

Find information for you on the subject of your choice.

Fill out forms on the Web automatically for you, storing your information for future reference.

Scan Web pages looking for and highlighting text that constitutes the “important” part of the information there.

Discuss topics with you ranging from your deepest fears to sports.

Facilitate with online job search duties by scanning known job boards and sending the resume to opportunities who meet the desired criteria.

Profile synchronization across heterogeneous social networks

- Monitoring-and-Surveillance Agent

Monitoring and Surveillance Agents are used to observe and report on equipment, usually computer systems. The agents may keep track of company inventory levels, observe competitors’ prices and relay them back to the company.

- Data-Mining Agents

This agent uses information technology to find trends and patterns in an abundance of information from many different sources. The user can sort through this information in order to find whatever information they are seeking. A data mining agent operates in a data warehouse, discovering information. A ‘data warehouse’ brings together information from lots of different sources. “Data mining” is the process of looking through the data warehouse to find information that you can use to take action, such as ways to increase sales or keep customers who are considering defecting.

‘Classification’ is one of the most common types of data mining, which finds patterns in information and categorizes them into different classes. Data mining agents can also detect major shifts in trends or a key indicator and can detect the presence of new information and alert you to it. For example, the agent may detect a decline in the construction industry for an economy; based on this relayed information construction companies will be able to make intelligent decisions regarding the hiring/firing of employees or the purchase/lease of equipment in order to best suit their firm.

CONCLUSION

This paper extensively stress on use of Software Agent in developing web application which will ease the usage of digital information available in large size. The digitalization process will reach to the grass root level if the ease of getting information increases. The different ways of how different types of software agents can help on web to mine the data is also illustrated in this paper.

REFERENCES


